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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LI, JUN

ART UNIT

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/566,070	<b>Applicant(s)</b> BERNSTEIN ET AL.	
	<b>Examiner</b> JUN LI	<b>Art Unit</b> 4181	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3,5-7,11-13 and 21-31 is/are pending in the application.  
     4a) Of the above claim(s) 11-13 and 21-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/26/2007</u> .                                              | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-3, 5-7 drawn to a method for producing a superconducting component.

Group II, claim(s) 11-13, drawn to a system for producing a superconducting component.

Group III, claim(s) 21-24, drawn to a product about a superconducting component.

Group IV, claim(s) 25-26, drawn to an antenna device.

Group V, claim(s) 27, drawn to a delay line device.

Group VI, claim(s) 28, drawn to a phase shift radar apparatus.

Group VII, claim(s) 29-31, drawn to an electronic frequency filter device.

The inventions listed as Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature which is referred to Annex B of Appendix A1 of the MPEP (Administrative Instructions under the PCT," Unity of Invention"). Unity

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exists only when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding claimed special technical features. In this case, the technical feature shared by each invention is the **superconducting inductive component**. The question of unity of invention has been reconsidered retroactively by the examiner in view of the search performed; a review of **Ishikawa et al. (US6066598)** and **Lee et al (IEEE TRANSACTIONS ON MAGNETICS, 1991, 27: 1365-1368)**, makes clear that the inventions of group I-III lacks the same or corresponding special technical feature because the cited reference(s) appear to demonstrate that the claimed technical feature does not define a contribution which each of the inventions, considered as a whole, makes over the prior art. Accordingly, the prior art of the record supports restriction of the claimed subject matter in to the groups as mentioned immediately above.

2. During a telephone conversation with Mr. Lawrence Crain on Oct 15<sup>th</sup> 2008 a provisional election was made to prosecute the invention of group I, claim1-3 and 5-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-13 and 21-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship

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must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

4. The examiner has required restriction between product and process claims. Where applicant elects claims directed to the product, and the product claims are subsequently found allowable, withdrawn process claims that depend from or otherwise require all the limitations of the allowable product claim will be considered for rejoinder. All claims directed to a nonelected process invention must require all the limitations of an allowable product claim for that process invention to be rejoined.

In the event of rejoinder, the requirement for restriction between the product claims and the rejoined process claims will be withdrawn, and the rejoined process claims will be fully examined for patentability in accordance with 37 CFR 1.104. Thus, to be allowable, the rejoined claims must meet all criteria for patentability including the requirements of 35 U.S.C. 101, 102, 103 and 112. Until all claims to the elected product are found allowable, an otherwise proper restriction requirement between product claims and process claims may be maintained. Withdrawn process claims that are not commensurate in scope with an allowable product claim will not be rejoined. See MPEP § 821.04(b).

Additionally, in order to retain the right to rejoinder in accordance with the above policy, applicant is advised that the process claims should be amended during prosecution to require the limitations of the product claims. **Failure to do so may result in a loss of the right to rejoinder.** Further, note that the prohibition against double patenting rejections of 35 U.S.C. 121 does not apply where the

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restriction requirement is withdrawn by the examiner before the patent issues.

See MPEP § 804.01.

### ***Status of Application***

1. Preliminary amendment filed 9/18/08 is acknowledged where applicant requested that cancelation of claims 4, 8-10 and 14-20. Thus claims 4, 8-10 and 14-20 are canceled. The claims 1-3, 5-7, 11-13 and 21-31 are pending and the elected claims 1-3 and 5-7 are presented for the examination. The non-elected claim 11-13 and 21-31 are withdrawn from further consideration.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 1- 2 and 6- 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

In claim 1, the term “one line segment” is not clearly defined in the instant claim which renders the claims not clear and indefinite, although instant specification describe briefly about “one line segment” at page, 2, lines 15-18.

MPEP clearly states that Limitations appearing in the specification but not recited in the claim should not be read into the claim. *E-Pass Techs., Inc. v. 3Com Corp.*, 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (claims must be interpreted “in view of the specification” without importing

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limitations from the specification into the claims unnecessarily). See MPEP 2106 R-6 part II. Thus, to obviate the 112 rejection, appropriate clarification is needed by defining the scope of the claims with clear description of the said term.

The term "plot" in claim 1 is used by the claim to mean "part" as in Fig 2 of disclosure, while the accepted meaning is "dot." The term is indefinite because the specification does not clearly redefine the term. Appropriate correction is required. It is also noted that where applicant acts as his or her own lexicographer to specifically define a term of a claim contrary to its ordinary meaning, the written description must clearly redefine the claim term and set forth the uncommon definition so as to put one reasonably skilled in the art on notice that the applicant intended to so redefine that claim term. *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1357, 52 USPQ2d 1029, 1033 (Fed. Cir. 1999).

6. The term "perfectly" in claim 2 is a relative term which renders the claim indefinite. The term "perfectly" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The term "latter" in claim 6, 7 is not clear because in the corresponding parent claim, there are more than two limitations involved; it is indefinite which limitation "the latter" refers to. Appropriate clarification is needed. "The latter" in claim 6 was examined as insulating film according to the previous step in claim 6 while "the latter" in claim 7 was examined as stack according to its parent claim 5 in the following prior art rejection.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**7. Claim 1, 3, 5 is rejected under 35 U.S.C. 102(b) as being anticipated by Ishikawa et al (US6066598).**

Regarding claims 1, Ishikawa et al anticipates

- a superconducting multilayer is formed on one side of a dielectric substrate (title and abstract lines 1-3, fig 1, 2)
- Superconductor film layer (Figure 1, 2 Items 1, 2, 3, 4, 5) and dielectric film layer (Figure 1, 2 30-1, 30-2, 30-3, and 30-4) are alternately laminated with each other ( abstract lines 3-4, column 3 lines 57).
- Formed sub-transmission lines (Figure 1 items LN1-LN4) comprising a superconductor and dielectric sandwich (column 4 lines 45-50, fig 1)
- Thin film of dielectrics are made of non-conducting substance such as SiO<sub>2</sub> (column 5 lines 17-18).
- Thin film of superconductor layers (Figure 1, 2 Items 1, 2, 3, 4, 5) are made of superconducting substances (column 5 lines 22-36)

Therefore, the instant claim 1 of a method for producing a superconducting component including a stack of alternately laminated superconducting and



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insulating (dielectric) layers and one line segment with a conducting or superconducting layer is not patentably distinct.

Regarding claim 3, Ishikawa et al teach insulating films (Figure 1, Items 30-1, 30-2, 30-3, and 30-4) deposited to a dielectric substrate (Figure 1 Item 10, column 3 lines 56-60).

Regarding claim 5, Ishikawa et al teach superconductor film layer (Figure 1 items 1, 2, 3, 4,5) and dielectric film layer (Figure 2 items 30-1,30-2,30-3,30-4) are alternately laminated with each other and a superconducting multilayer electrode is formed on the top surface of a dielectric substrate (Figure 1 item 10, column 3 lines 56-60).

Since all the critical elements are well taught by cited reference, the claims are properly included in the instant rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
8. **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al (US6066598) in view of Lee et al (IEEE TRANSACTIONS ON MAGNETICS, 1991, 27: 1365-1368).**

The reference of Ishikawa et al has been described as above. Ishikawa et al do not expressly state that the material for superconducting and dielectric film is crystallized.

Lee et al teach that the  $\text{LaAlO}_3$  and YBCO (i.e.  $\text{YBa}_2\text{Cu}_3\text{O}_7$ ) (page 1365 left column "introduction" second paragraph line 2) can be used for superconducting multilayers (abstract lines 1-2), where  $\text{LaAlO}_3$  and YBCO films can be crystallized (page 1366 left column "Results" first paragraph lines 1-4) with sharp and clean interface between the deposited insulating crystal  $\text{LaAlO}_3$  and its substrate as indicated by Lee et al (page 1365 abstract lines 6-7).

It would have been obvious to one ordinary skill in the art the time of invention filed to crystallize the insulating and superconducting film because the crystallization of the films can provide sharp and clean interface between the insulating and superconducting film as indicated by Lee et al (page 1365 abstract lines 6-7). Therefore, one ordinary skill in the art would have appreciated to adopt the beneficial film crystallization feature of Lee et al's teaching to modify the superconducting multilayers of Ishikawa et al. The suggestion or motivation for doing so would have been to provide a sharp and clean interface between the alternately deposited superconducting and insulating films (Abstract).

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**9. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al (US6066598) in view of Sung et al (US5750474).**

Regarding claim 6-7, the reference of Ishikawa et al has been described as above.

However, Ishikawa et al do not explicitly teach etching of the stacked alternately superconducting and insulating film.

Sung et al (US5750474) teaches:

- Dry-etching lower YBCO electrode (Figure 4C item 3) a superconducting layer (column 5 claim 1 lines 17-18, abstract lines 4-7)
- Dry-etching barrier layer (insulating layer, Figure 4F item 5) and YBCO upper electrode layer (upper superconducting layer, Figure 4F item 6) (claim 1 column 5 lines 26-30, abstract lines 4-7)
- A barrier layer (Figure 4D item 5) consisting of an insulating film formed on the etched YBCO lowered electrode superconducting layer (Figure 4D item 3), this barrier layer is deposited underneath the upper electrode layer (upper superconducting layer, Fig 4D item 6) (column 4 lines 17-20).

Sung et al teaches a method of successfully etching a superconductor (electrode figure 4 item 6)-insulator (Figure 4 item 5)- superconductor (Figure 4 item 3) stack wherein insulating layer (Figure 4 item 5) and superconducting layer 3, 6 (Figure 4 item 3,6) are all etched as stated above for probable pattern and fabrication.

It would have been obvious to one ordinary skill in the art the time of invention filed to adopt the etching technique as taught in Sung et al to fabricate

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the multilayer superconductors because this known technique can successfully stack different components of multilayer superconductors. Therefore, one ordinary skill in the art would have appreciated to adopt this known etching technique in Sung et al's to modify the superconducting multilayers of Ishikawa et al for a successful stacking of a multilayer superconductor.

One would have been motivated to do so to increase industrial applicability by adding more practical options with predictable results where effectiveness is proven as suggested by Sung et al.

### ***Conclusion***

All the elected claims are rejected for the reasons of the record.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, Ishikawa et al (US 6148221), Lee et al, (*Appl. Phys. Lett.* 1990, 57: 2019-2021).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUN LI whose telephone number is (571)270-5858. The examiner can normally be reached on Monday-Friday, 8:00am EST-5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jun Li

October 22, 2008

Art unit 4181

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4181

